ADAMS and Great Bay Wind

17 JAN 2014

Presented to:

The Honorable Mr. Steny Hoyer
U.S House of Representatives

The Honorable Mr. Dennis McGinn
Assistant Secretary of the Navy
Energy, Installations and Environment

Presented by:

Mr. Christopher Jarboe
NAVAIR Ranges Sustainability Office

NAVAIR

Agenda

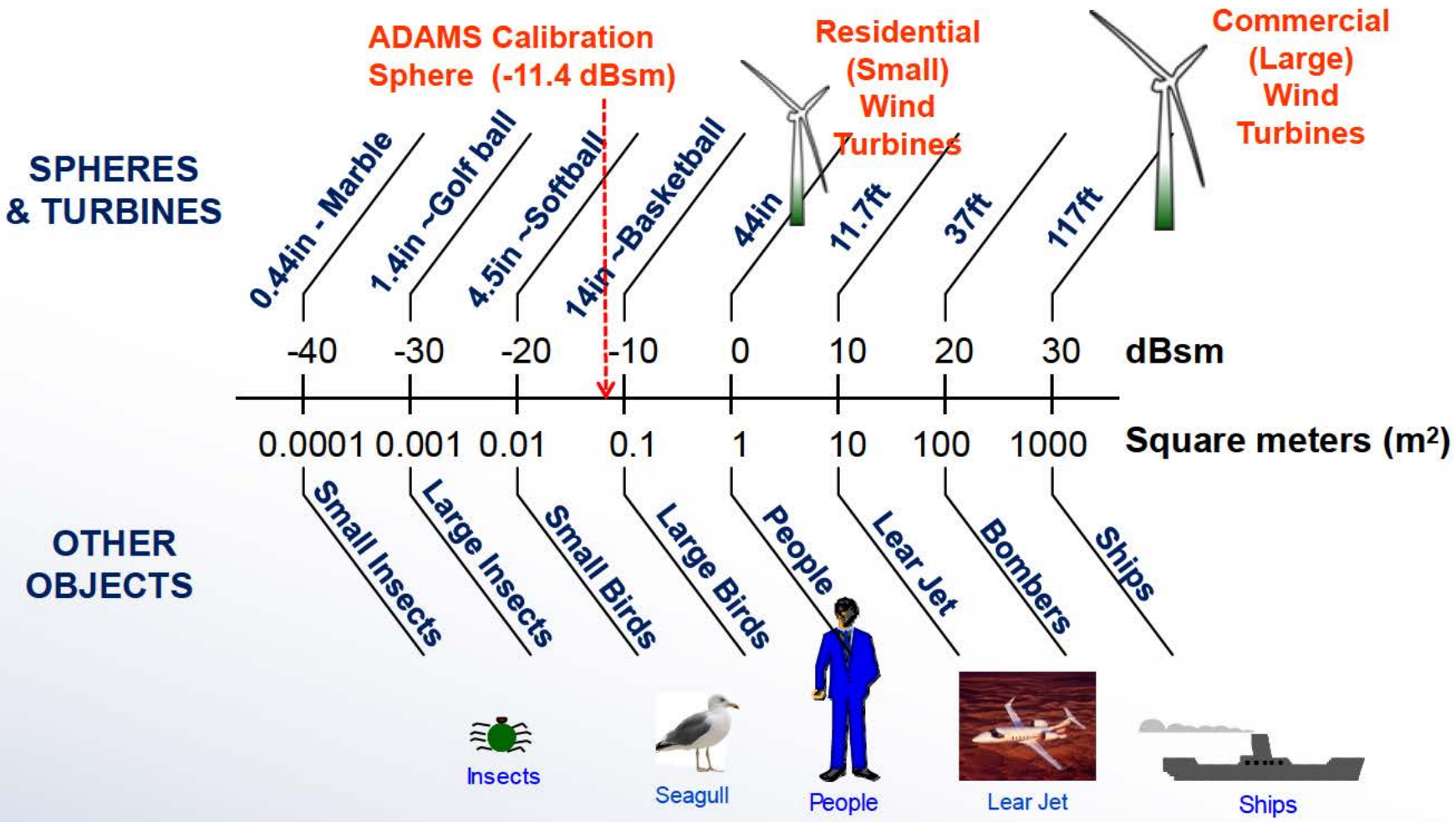
- Wind Turbine Impacts to ADAMS
- Wind Energy Developments
- Great Bay Wind Project
- Curtailment Agreement Overview

Background

- Large radar cross sections and rotating blades of wind turbines create environments that present formidable challenges to the conduct of required RDT&E
- ADAMS sensitivity and frequency diversity make it particularly susceptible to wind turbine interference and limit mitigation options
- Modeling shows that even small residential turbines will degrade ADAMS capability
- ADAMS is the only Navy open air dynamic RCS measurement facility and is integral to NAWCAD full spectrum aircraft RDT&E mission

ADAMS Measurement Antennae

RCS Magnitudes - ADAMS Sensitivity

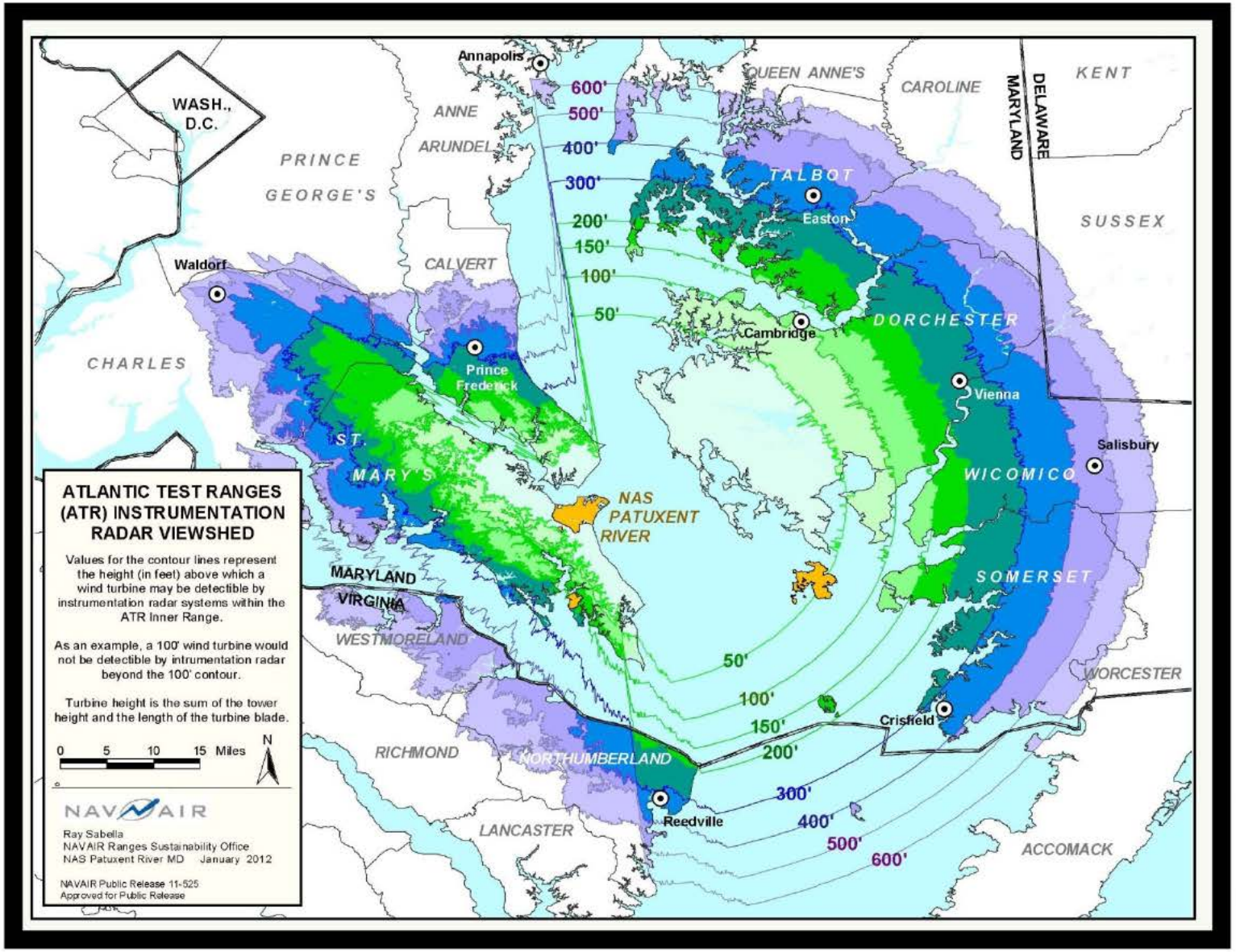


- RCS magnitudes expressed in decibels (dB) due to wide range of values
- 0 dBsm reference = 1 square meter surface area of frequency-independent metal sphere

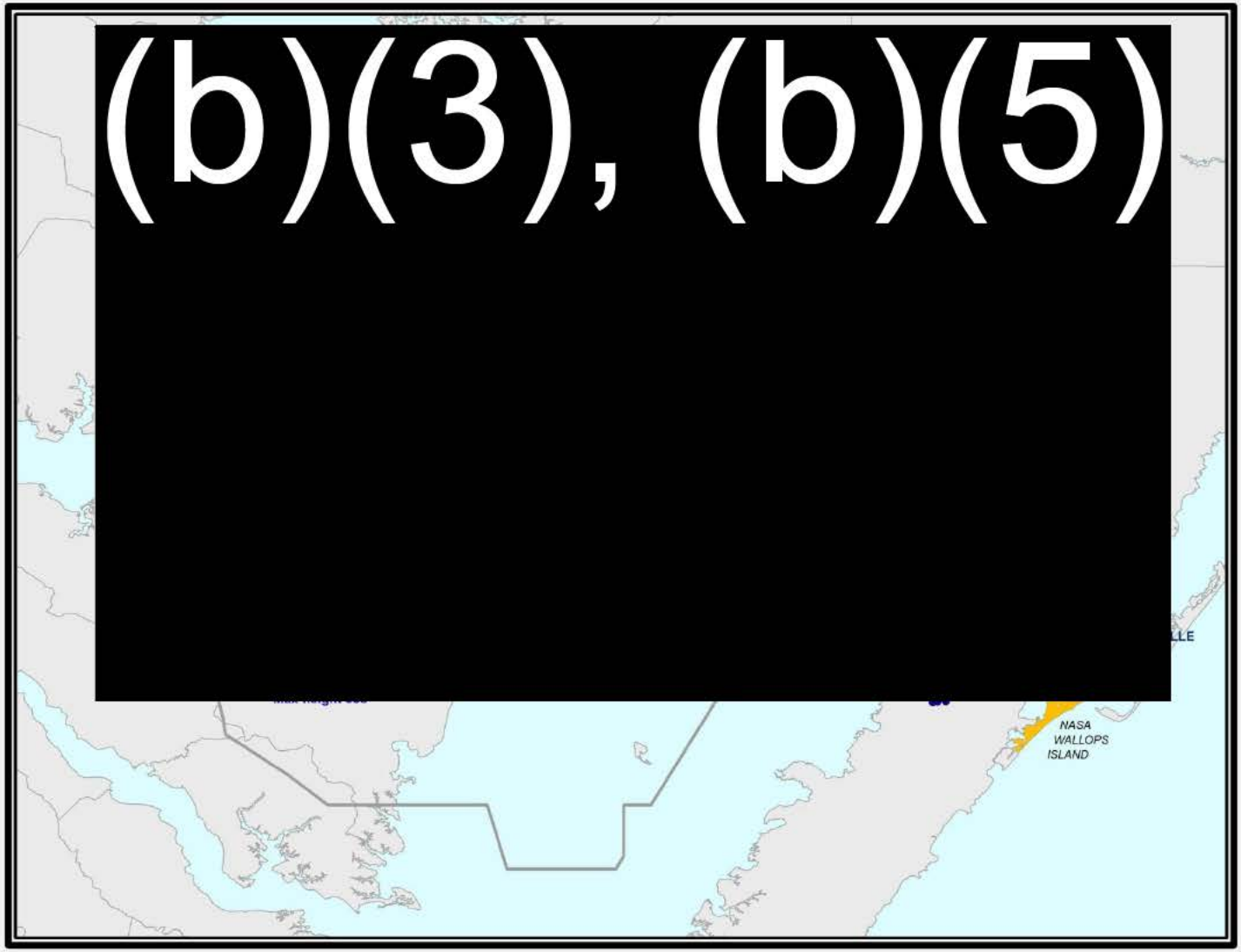
MIT Lincoln Labs

- MIT-LL validated wind turbine impacts to ADAMS
- For near term MIT-LL recommended keeping turbines out of RF LOS
- Curtailment of turbines during test also presented
- MIT-LL identified long term technical mitigation options that require further study such as signal encoding and RF blocking techniques (e.g. RF fence)
- Navy funded Wind Energy Impact Mitigation study underway to assess feasibility of long term mitigations

ADAMS RF Line of Sight



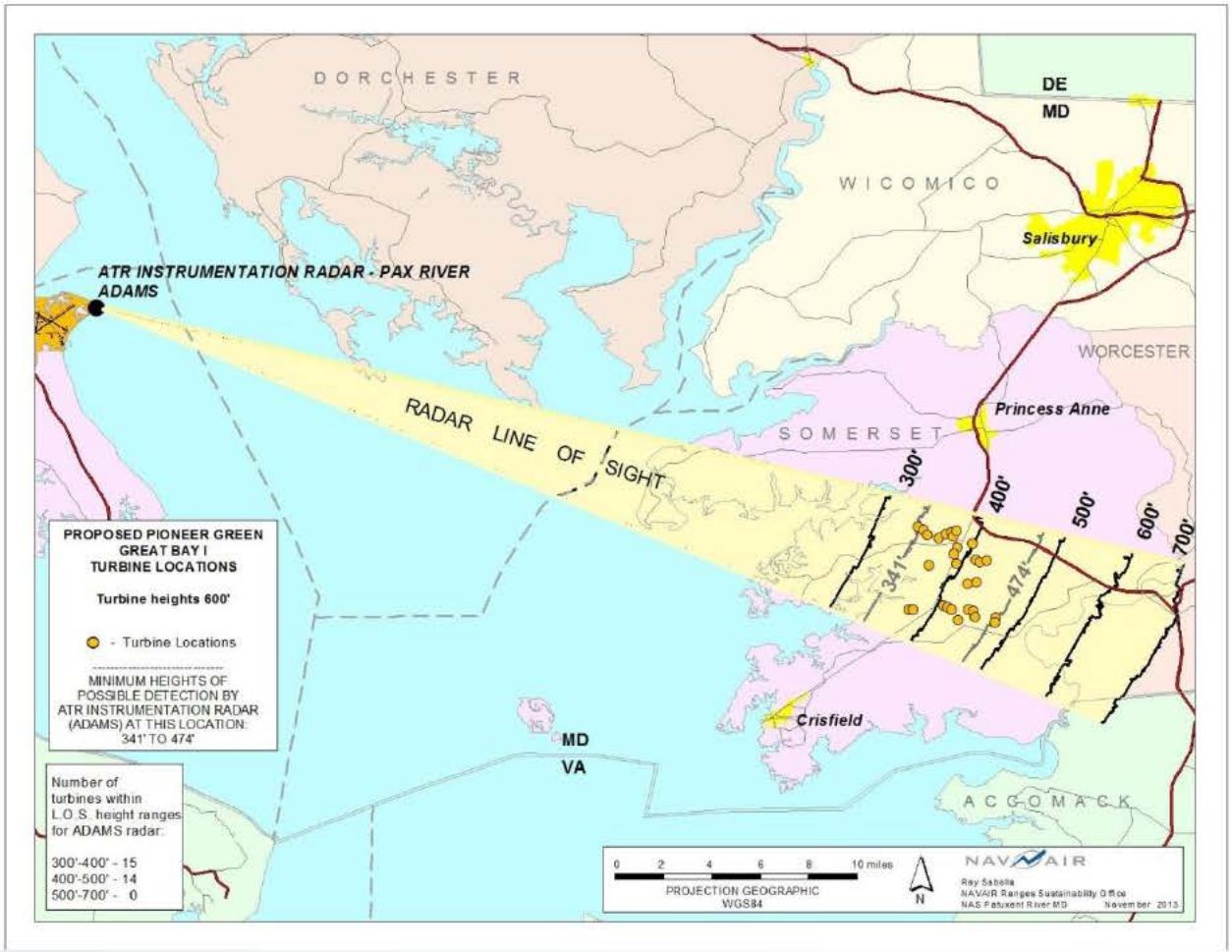
Proposed Wind Energy Developments



Business Proprietary Information

Pioneer Green Great Bay Wind I

- Initial proposal of 70 to 100 turbines 400 to 500 feet AGL
- Formal proposal of 25 turbines at 599 feet AGL filed with FAA 14 OCT 2013
- All turbines within ADAMS RF line of sight



Curtailment Agreement Overview

- Specifies turbine number, location and height
- Establishes curtailment protocol and hours
- Contains a dispute resolution process which includes option of non-binding arbitration
- Recommends terms and conditions of the agreement be incorporated into other permits, certificates and licenses
  - MD Public Service Commission Certificate of Public Convenience and Necessity
  - FAA aeronautical study and determinations
- Provides for “Assignment” for potential purchasers
- Includes agreement to pursue feasible and affordable mitigation measures (beyond curtailment)

Impact of Curtailment

- Technical and cost risk that mitigations identified by MIT-LL may not be technically feasible or be cost prohibitive
  - Signal encoding with Barker code for better range resolution carries high risk
  - RF clutter fence to block turbine signal returns carries high risk

(b)(3), (b)(5)

- Concept of Operations (CONOPS) changes
- Future customer requirements
- Test schedule risk